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09/506,160	02/17/2000	Bruce H.T. Chai	UCF-237	7317

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03/08/2002

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EXAMINER

HANNAHER, CONSTANTINE

ART UNIT

PAPER NUMBER

2878

DATE MAILED: 03/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/506,160

Applicant(s)

CHAI ET AL.

Examiner

Constantine Hannaher

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5 and 7-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5 and 7-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 6) ☐ Other:

## DETAILED ACTION

### Information Disclosure Statement

1. With respect to the Information Disclosure Statement filed February 17, 2000, the crossing out of the listings for patents to Moorman is evidence that the Examiner has not considered them. The submission of these patents to Moorman was not complete, so they do not qualify as a legible copy as required by the rule.

### Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 5, 7-9, and 10-20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites "a photon detector coupled to said crystal said crystal when exposed to a high energy gamma ray." In view of the repetition and the ambiguity as to whether the scope of the claim includes the photon detector based on whether the crystal is exposed or not, the claim is indefinite.

Claim 10 recites the step of "detecting energy from a detector coupled to the crystal." In view of the ambiguity in the antecedent basis for "energy" and for "detector" and what detecting "from" might mean when the disclosure is fairly clear that such a step would recite detecting *photons with* a (photon) detector coupled to the crystal, the claim is indefinite.

Claim 20 recites the limitation "x" in line 1 and the limitation "y" in line 2. There is insufficient antecedent basis for this limitation in the claim. Claim 19 provides the required antecedent basis.

The balance of the claims are rejected on the basis of their dependence.

**Claim Rejections - 35 USC § 102**

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 1 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ozawa (US004549083A).

With respect to independent claim 1, Ozawa discloses a scintillator detector for high energy (“X-ray”) radiation comprising a monocrystalline structure **P** (Fig. 6) comprising cerium doped lutetium yttrium orthosilicate (claims 8, 12, and 17).

**Claim Rejections - 35 USC § 103**

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made

in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1, 2, 4, 5, 7-13, 20, and 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Melcher (US004958080A) in view of Watanabe *et al.* (GB001336518A).

With respect to independent claim 1, Melcher discloses a scintillator detector (Fig. 1) for high energy radiation (gamma rays and like radiation, column 1, line 9) comprising a monocrystalline ("single crystal," column 3, line 49) structure **10** of cerium doped lutetium orthosilicate (column 4, line 9). Although the scintillator composition does not comprise yttrium, it is known from Watanabe *et al.* that a cerium doped lutetium yttrium orthosilicate phosphor is even more promising in terms of its scintillation properties (Table IV) as the cerium doped lutetium orthosilicate prepared by Melcher (column 4, lines 8-19). Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the monocrystalline structure **10** of Melcher to have it comprise the luminescent material suggested by Watanabe *et al.* in view of the reasonable expectation of success based on the higher luminescence activity (more intense luminescence) reported therein.

With respect to dependent claim 2, the mole ratio of lutetium and yttrium in the phosphor composition suggested by Watanabe *et al.* (corresponding to the recited "y") is within the recited range (Table IV). The proportion of cerium suggested by Melcher is within the recited range (Table 4).

With respect to dependent claim 4, the mole ratio of lutetium and yttrium in the phosphor composition suggested by Watanabe *et al.* (corresponding to the recited "y") is within the recited range (Table IV). The proportion of cerium suggested by Melcher is within the recited range (Table 4).

With respect to independent claim 5, the coupling of a photon detector to a scintillator crystal for the recited reasons is so well known as to not require the citation of any reference. Nevertheless, such a coupling is shown by Melcher (Fig. 1) with photon detector **16**.

With respect to dependent claim 7, the mole ratio of lutetium and yttrium in the phosphor composition suggested by Watanabe *et al.* (corresponding to the recited "y") is within the recited range (Table IV). The proportion of cerium suggested by Melcher is within the recited range (Table 4).

With respect to dependent claim 8, the mole ratio of lutetium and yttrium in the phosphor composition suggested by Watanabe *et al.* (corresponding to the recited "y") is within the recited range (Table IV). The proportion of cerium suggested by Melcher is within the recited range (Table 4).

With respect to dependent claim 9, the coupled photon detector **16** suggested by Melcher is one of the recited alternatives.

With respect to independent claim 10, Melcher suggests a method corresponding to the illustrated apparatus (Fig. 1) of detecting energy with a scintillation detector **28** which would comprise the steps of receiving radiation by a crystal **10** of cerium doped lutetium orthosilicate (column 4, line 9) and detecting "energy from" a detector **16** coupled to the crystal **10**. Although the composition of the crystal **10** does not comprise yttrium, it is known from Watanabe *et al.* that a cerium doped lutetium yttrium orthosilicate phosphor is even more promising in terms of its scintillation properties (Table IV) as the cerium doped lutetium orthosilicate prepared by Melcher (column 4, lines 8-19). Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the crystal **10** of Melcher to have it comprise the

luminescent material suggested by Watanabe *et al.* in view of the reasonable expectation of success based on the higher luminescence activity (more intense luminescence) reported therein.

With respect to dependent claim 11, the step of receiving radiation suggested by Melcher and Watanabe *et al.* includes the step of receiving gamma rays (Melcher at column 1, line 9 and column 3, line 46).

With respect to dependent claim 12, the step of receiving radiation suggested by Melcher and Watanabe *et al.* includes the step of receiving like radiation (Melcher at column 1, line 9) which is understood to include x rays (Melcher at column 1, line 13 and column 3, line 48).

With respect to dependent claim 13, the step of receiving radiation suggested by Melcher and Watanabe *et al.* includes the step of receiving like radiation (Melcher at column 1, line 9) which is understood to include cosmic rays (Melcher at column 1, line 13 and column 3, line 48).

With respect to dependent claim 20, the mole ratio of lutetium and yttrium in the phosphor composition suggested by Watanabe *et al.* (corresponding to the recited "y") is within the recited range (Table IV). The proportion of cerium suggested by Melcher is within the recited range (Table 4).

With respect to dependent claim 14, the step of receiving radiation in the method suggested by Melcher and Watanabe *et al.* includes the use of a monocrystalline ("single crystal," Melcher at column 3, lines 12-13 and line 49).

With respect to dependent claim 15, the step of detecting in the method suggested by Melcher and Watanabe *et al.* includes detecting light with a photodetector 16 coupled to the crystal 10.

With respect to dependent claim 16, the step of detecting in the method suggested by Melcher and Watanabe *et al.* includes detecting light with a photomultiplier tube **16** coupled to the crystal **10** (Melcher at column 10, lines 2-3).

With respect to dependent claims 17 and 18, although the step of detecting in the method suggested by Melcher and Watanabe *et al.* includes detecting light with a photomultiplier tube **16** coupled to the crystal **10** (Melcher at column 10, lines 2-3) the use of any other suitable light detector would have been obvious to one of ordinary skill in the art at the time the invention was made in view of the variety available of effective performance (Melcher at column 3, lines 55-57).

With respect to dependent claim 19, the mole ratio of lutetium and yttrium in the phosphor composition suggested by Watanabe *et al.* (corresponding to the recited “y”) is within the recited range (Table IV). The proportion of cerium suggested by Melcher is within the recited range (Table 4).

### **Response to Submission(s)**

9. The amendment filed February 11, 2002 has been entered. The amendment is not in compliance with 37 CFR 1.121 because the marked up version supplied for claim 5 does not acknowledge the utter omission of “, whereby an electrical signal is generated in response to a light pulse from” and because the marked up version supplied for 7 does not acknowledge the change in the dependence.

10. Applicant's arguments filed February 11, 2002 have been fully considered but they are not persuasive.

The structure **P** in Ozawa is consistently described as a crystal. There is no description of the structure **P** as a polycrystalline powder and applicant has not identified any such description. Since each crystal **P** may comprise a silicate of at least one (that is, including two or more is within the



scope of the disclosure) of lutetium and yttrium activated (that is, doped) with cerium as stated in the claims identified in the statement of the rejection, there is no basis to contend that the “subject claimed monocrystal material” is not cited in Ozawa.

The contention that Melcher describes “fine powder phosphors and not monocrystal scintillation detectors” is troubling and not at all persuasive in view of the extensive identifications by Melcher of element **10** as a single crystal scintillation detector (see, for example, column 1, lines 8-11, column 3, lines 10-14, column 3, lines 44-45, column 3, line 49, column 6, lines 47-55, column 8, line 30, column 9, line 7, or claim 1, line 2). As for the combination with Watanabe *et al.*, and in contradiction with the assertion implicit in the citation of *In re Bond*, the Examiner has supplied a teaching, suggestion, incentive or motivation (“a cerium doped lutetium yttrium orthosilicate phosphor is even more promising in terms of its scintillation properties” as the “cerium doped lutetium orthosilicate” which Melcher converted into a single crystal scintillator) which is derived entirely from the two references without any recourse to Applicant’s disclosure. There is a reasonable expectation of success (Melcher converted the phosphor to a single crystal scintillator and pronounced it “satisfactory” [column 7, line 66] based on “previous experience with other single crystal scintillators and powder phosphors”). *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986); *Ex parte Blanc*, 13 USPQ2d 1383 (Bd. Pat. App. & Inter. 1989). See MPEP § 2413.02. Attorney’s arguments cannot take the place of evidence, so the discussion of among other things, “the phase rule,” cannot be persuasive. The argument regarding the makeup of the composition of Watanabe *et al.* is too general to comply with 37 CFR 1.111(b) and (c) and cannot be persuasive, either.

An interference between a pending application and a patent is normally provoked by the applicant. MPEP § 2300.02.

For at least the reasons explained above, Applicant is not entitled to a favorable determination of patentability in view of the arguments submitted February 11, 2002.

### **Conclusion**

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Constantine Hannaher whose telephone number is (703) 308-4850. The examiner can normally be reached on Monday-Friday with flexible hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seungsook (Robin) Ham can be reached on (703) 308-4090. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and Not Established for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Application/Control Number: 09/506,160

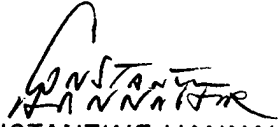
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March 7, 2002

  
CONSTANTINE HANNAHER  
PRIMARY EXAMINER  
GROUP ART UNIT 2878